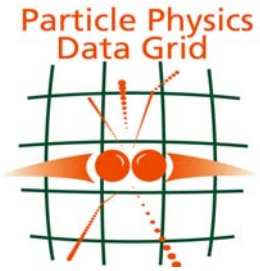

Particle Physics Data Grid Collaboratory Pilot Management Plan V1.00 10/10/01

1 Overview

U.S Physics Experiment computing management and Computer Science project management have joined the PPDG proposal with a common vision to work together to develop and apply Grid software to the benefit of each experiment, and with a commitment to adapt, extend and reuse information technology and software used in one experiment for the benefit of other experiments. The PPDG management plan is designed to provide sufficient coordination of the specific project deliverables and milestones, as well as show our commitment to a process of working together towards the common goal.

The PPDG management challenge is described graphically Figure 1. The circles and ellipses show the relationship between, and approximate relative sizes of, the proposed PPDG-funded team, the teams in the physics experiments concerned with Grid applications and data management, and the Physics Collaborations and CS projects. The obvious challenge, optimal coordination of all Grid-related efforts in spite of the time pressures and physics-focused mission of the experiments, is also an outstanding opportunity. The collective resources that the experiments and CS projects can bring to bear on Grid enabled developments of common interest provide a many-fold leverage of the proposed PPDG funding. Working together closely on these developments will provide both communities with the best environment to meet their scientific goals.

The PPDG management strategy has top-down and bottoms-up components. The bottoms-up strategy involves exploiting the mission-oriented drive of the physics experiments, part of which is already directed towards strengthening collaborations with PPDG-CS and with U.S. and European Grid projects outside of PPDG. The involvement of the CS projects is driven by their desire to test and evaluate their technology in a real-life setting.

The top-down strategy must ensure the steering of the powerful bottoms-up forces to ensure that, while the individual goals of each of the experiments and the CS projects are met, most developments are of value to other PPDG collaborators, and with little or no additional generalization, to a wide user community. In addition, PPDG must join in the effort to steer collaborations of individual PPDG members with other Grid projects such that a common Grid architecture emerges and all funding is used effectively.

2 Project Management

2.1 Management Structure

The PPDG management structure shown in Figure 2 consists of:

- The **Project PIs** who have overall responsibility for the project to the SciDAC funding agencies. The PIs are responsible for interfacing to the other SciDAC projects and related oversight and funding bodies. They are aware of similar efforts involving other scientific disciplines and commercial bodies, and represent PPDG in these matters.

  The PIs are: Miron Livny (Computer Science), Richard Mount (Experiment Laboratory), Harvey Newman (Experiment University)

- An **Executive Team** composed of Ruth Pordes (PPDG Steering Committee Chair), Doug Olson (Steering Committee Physics Deputy Chair) and Miron Livny (Steering Committee Computer Science Deputy Chair). The executive team tracks the goals and work of the physics-CS project and activity teams and provides guidance to ensure overall coherence of the PPDG Collaboratory Pilot. Miron Livny steers the project deliverables towards maximal commonality (and wide usability) in the components of each experiment's vertically integrated Grid software. The team will work together to advise the Steering Committee to best meet

the short and long term goals of the Collaboration. The Executive Team will bring to the attention of the Steering Committee matters for strategy, policy and decision – including the establishment of cross-cutting activities across the experiment/CS groups, budgetary matters, project activity or effort reviews, inter-project working groups or task forces.

- A **Steering Committee (SC)** comprising a Team Lead from each Experiment and each Computer Science group. The project PIs and the executive team will be ex officio members of the Steering Committee. In the interests of keeping the SC small and effective, the project PIs and members of executive team may also act as experiment or CS group representatives if they wish. The preliminary membership of the Steering Committee is:

  Ruth Pordes, Chair, Executive Team, D0 Team Lead
  Miron Livny, Project PI, Computer Science Deputy Chair, Executive Team, U.Wisc CS Team Lead.
  Doug Olson, Physics Deputy Chair, Executive Team
  Richard Mount, Project PI, BaBar Team Lead.
  Harvey Newman, Project PI
  Lothar Bauerdick, CMS Team Lead
  Torre Wenaus, ATLAS Team Lead
  Chip Watson, JLab Team Lead
  Matthias Messer, STAR Team Lead
  Ian Foster, ANL CS Team Lead
  Arie Shoshani, LBNL CS Team Lead.
  Reagan Moore, SDSC CS Team Lead

  The steering committee is structured to provide decisive management and to balance the Computer Science, software technology, physics-experiment needs and budgetary constraints.

  The Steering Committee will hold monthly phone/video conference meetings. The Steering Committee will publish agendas and minutes of their meetings. The Steering Committee and Executive Team are charged with ensuring that successful communication and coordination exists throughout the Collaboratory Pilot.

  The Steering Committee is responsible for the policy, strategy and decision making within the Collaboratory Pilot. The agendae of the committee meetings are stimulated by requests from the PIs, Executive Team, project activities, individual requests, or communications from outside of the project itself. Decisions will be documented in Steering Meeting minutes and the subsequent Quarterly Report. The Steering Committee can charge the executive team, projects or sub-groups to act on its behalf.

  Change Management - The Steering Committee is responsible for any changes to the Project goals and deliverables. Any change will pass through a proposal, review and decision at a Steering Committee and documented as part of the Quarterly Report to the SciDAC oversight body.

  Reviews - The Steering Committee will charge the Executive Team to organize peer reviews of project activities and efforts when needed. Reports of such reviews will be delivered to the Steering Committee and recorded in the subsequent Quarterly Report.

- A **Team Lead** from each of the Computer Science and High Energy and Nuclear Physics Experiment groups. Each Team Lead is responsible for the deliverables, schedule and performance of the PPDG effort from his/her experiment or CS group. They are members of the Steering Committee. Each Team Lead is responsible for ensuring that the PPDG deliverables and directions are aligned with those of the Experiment or Computer Science group of which they are a member. They work with the PPDG Steering Committee and the Experiment or Computer Science group in order to guide PPDG projects to produce necessary and usable components of their larger systems, and achieve adoption of PPDG deliverables by the end users. The Team Lead works with his/her Experiment or Computer Science group to ensure the successful integration, deployment and support of the PPDG deliverables in the overall experiment data handling system, or computer science group systems. The Team Leads are responsible for the individual Experiment/CS group or institution Project Efforts and to work with the participants and the Executive Team to move these efforts towards collaborative Activities to meet the goals of the PPDG project.

- **Project Activity Leads and Liaisons.** The core PPDG development work is structured as Experiment-CS Project Activities. Many of the experiment work plans have commonality both in scope and schedule. Some Project Activities will be targeted to meet the need of one specific Experiment-CS deliverable, with

coordination and cooperation between concurrent activities occurring through the PPDG management structure. In other cases the experiment and computer scientist teams will agree on a common activity, which will still follow the PPDG development model. Each PPDG Project Activity will be led by a two or three person team:

- an overall project lead if the project is broader in scope than PPDG and involves a collaboration with other peer projects in the field (e.g. European Data Grid, GriPhyN)
- an experiment(s) representative that will provide overall coordination and prioritization of the experiments needs
- a Computer Scientist who will identify applicable Grid technologies and coordinate the involvement of one or more CS projects in the activity

Together, these individuals will produce and track a project plan for the activity, report on its progress and be responsible to the PPDG management for its schedule and delivery.

2.2 Reporting

Each member of the PPDG project is responsible for submitting to the Steering Committee a short monthly briefing update on the technical aspects of their work. Each Team Lead is responsible for submitting a quarterly report to include a summary of the work of their team, achievements, work in progress, plans and schedules and an accounting of the individual effort in their team accounted to the PPDG project. The Executive Team is responsible for delivering the Project Quarterly report to the SciDAC oversight management.

2.3 Collaboration Meetings

Biweekly phone conferences are held to discuss ongoing Project Activities and Efforts. Each PA /PE will periodically present their progress and plans for technical discussion. Other activities and issues will be discussed as proposed for the agenda by any members of PPDG.

Bi-annual multi-day collaboration meetings will be organized by the Executive Team. These meetings are an opportunity for presentation of the breadth and depth of the work of the project, and for more in depth discussion of technical and strategic issues. These collaboration meetings are open to both members of the SciDAC oversight and other collaboratory projects, and peer projects in the field.

3 Outreach

3.1 Coordination with other Data Grid projects

Members of the Steering Committee are responsible working with the other major Data Grid projects in the U.S., Europe, and Japan to ensure effective coordination and communication among all parties. The Executive Team communicates with its peers on the other major US and HENP experiment projects – GriPhyN, iVDGL, European Data Grid, LHC Computing Grid Project – to provide a mutual understanding of the technical directions and efforts, and where appropriate bring to the attention of the Steering Committee ideas for inter-project collaboration.

3.2 Education

PPDG will involve students in our activities during the summer periods, especially in the testing and deployment phases of the project. We will leverage existing summer programs that include outreach to minority communities (e.g. at ANL, the U of Wisconsin, SLAC and Fermilab to employ and involve students and teachers in the application activities. The PPDG focus on end-to-end solutions provides a good base for temporary participants to learn and contribute in practical terms to the use of the Grid in the context of a physic experiment.

The Executive Team is coordinating with existing ATLAS and CMS construction project outreach. The first such activity will take place in the summer of 2002 working through the Fermilab Trac Teachers program and is hoped to be a multi-year activity.

4 Development and Deployment Process

The development process is driven by the vision and belief that the continued coordinated search for commonality derived from actual practice will deliver the most effective solutions in an efficient way. It is founded on previous

experience, including the Experiment-CS collaboration model of the Condor development at the University of Wisconsin and the Grand Challenge STACS project with the STAR experiment.

4.1 Project Activities

Project Activities are the primary areas of effort in PPDG and have a directed collaborative focus between the experiment and CS teams. For each Project Activity the project leaders will develop and publish a detailed plan to complete all necessary development and integration and to phase them into production. Regular status of each activity will be presented to the collaboration. Each Project Activity will consist of

- Deliverables assessment analysis and deployment plan
- Specification and design (including commonality assessment and planning)
- Execution of deployment plan – including documentation and testing.
- Operation of service and performance analysis
- Analysis of future needs and potential for adapting the deliverable to other experiments.

4.2 Project Efforts

A Project Effort is generally considered to be a small scale exploratory work relevent to the needs of the particular experiment or CS team, and should evolve into a Project Activity. Each Project Effort shall provide a description of the focus, deliverables and schedule. The Team Lead of the Experiment or CS group whose effort is being deployed will work with the participants and encourage the efforts towards becoming Project or Cross-Cut Activities.

4.3 Cross-Cut Activities

These activities are sponsored by the PPDG Steering Committee as contributing to and affecting all or most experiments and CS groups. Cross-cut activities will typically involve a more specific technical or topic area focus on providing a common infrastructure, component or standard across PPDG or as a collaboration between PPDG and other projects.

5 Project Management Structure

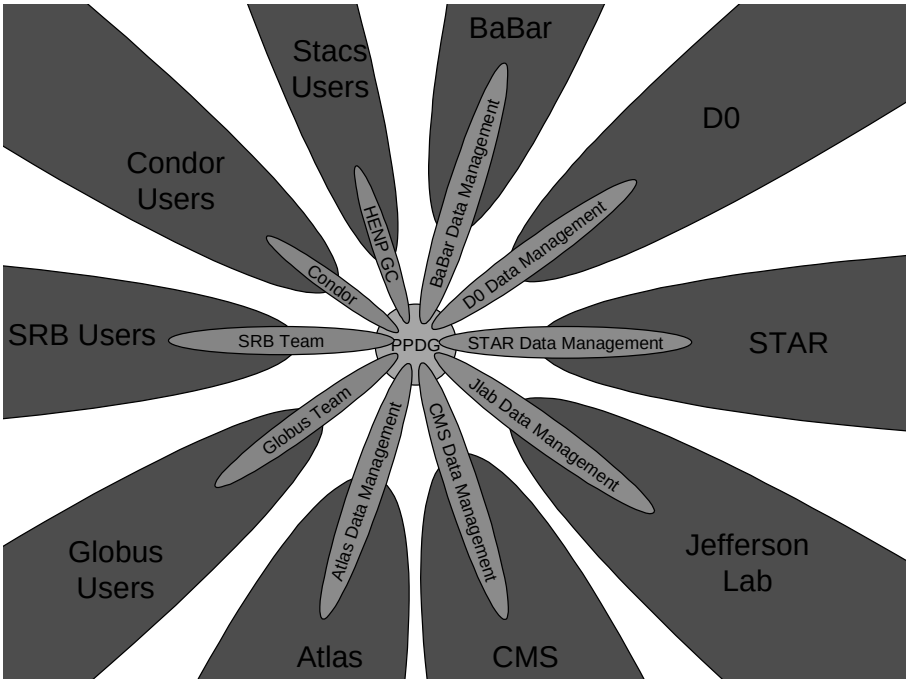

Figure 1. The PPDG World

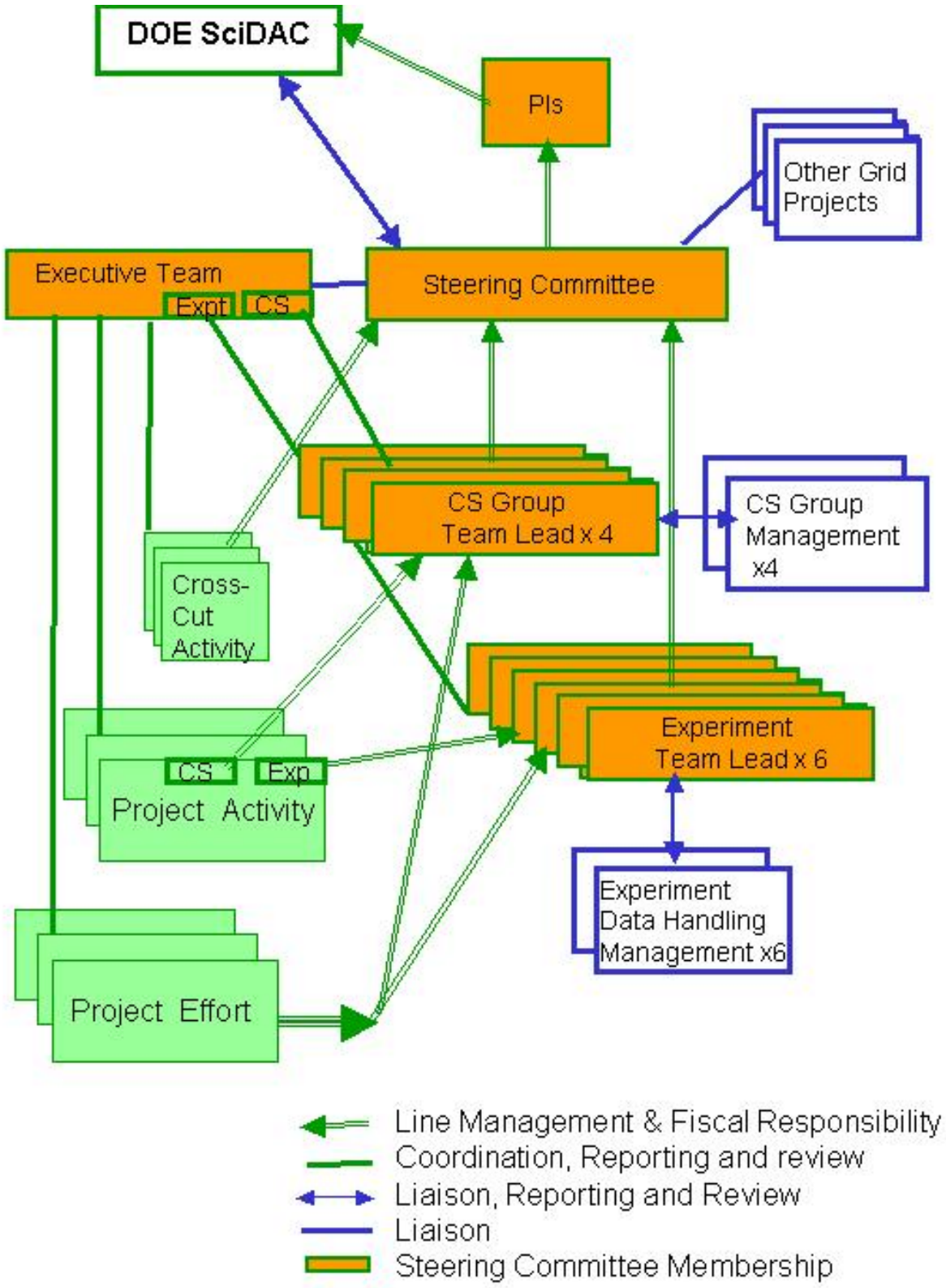

Figure 2. PPDG Management Structure

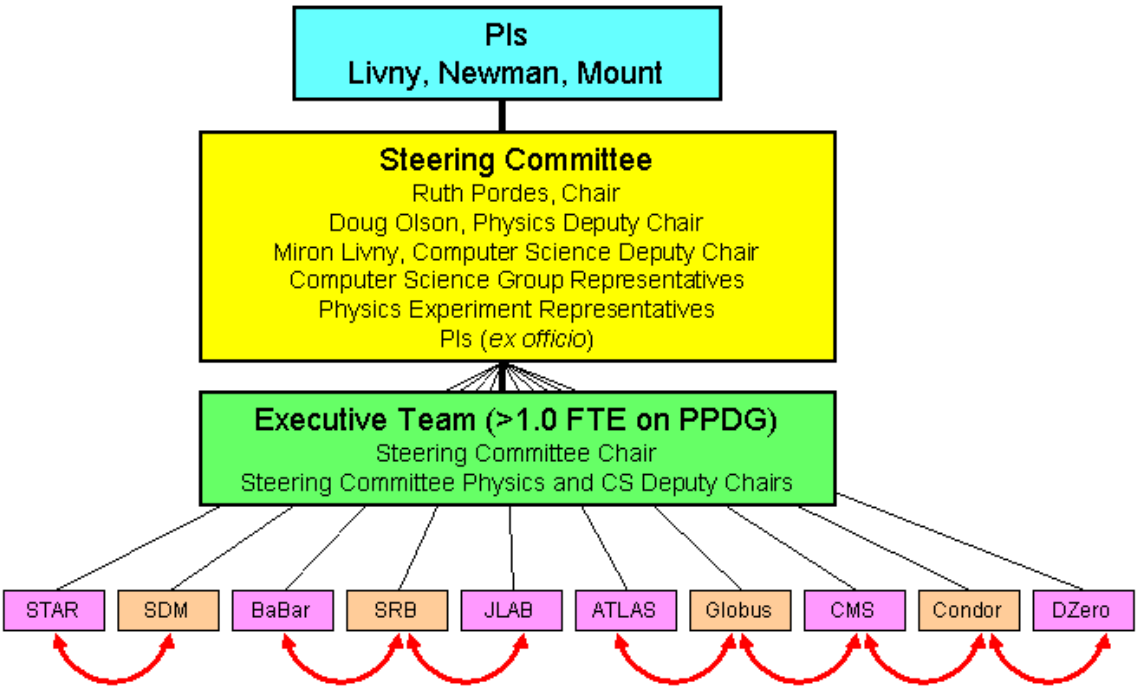

Figure 3. PPDG Project Activity Management Structure